

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 23 JAN 2006

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Applicant's or agent's file reference 64075	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/US2004/043342	International filing date (day/month/year) 24.12.2004	Priority date (day/month/year) 24.12.2003	
International Patent Classification (IPC) or national classification and IPC C08L101/00, C08K5/14, C08K5/3435, C08G18/00			
Applicant DOW GLOBAL TECHNOLOGIES INC.et al.			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 10 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☐ sent to the applicant and to the International Bureau a total of sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

Date of submission of the demand 22.07.2005	Date of completion of this report 24.01.2006
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Bergmans, K Telephone No. +31 70 340-



**INTERNATIONAL PRELIMINARY REPORT
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International application No.
PCT/US2004/043342

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-19 as originally filed

Claims, Numbers

1-10 as originally filed

Drawings, Sheets

1-5 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:
- ☐ the entire international application,
 - ☒ claims Nos. 7, 10
- because:
- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):
 - ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
 - ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
 - ☒ no international search report has been established for the said claims Nos. 7, 10
 - ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:
 - the written form ☐ has not been furnished
 - ☐ does not comply with the standard
 - the computer readable form ☐ has not been furnished
 - ☐ does not comply with the standard
 - ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.
 - ☐ See separate sheet for further details

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Box No. IV Lack of unity of invention

1. ☒ In response to the invitation to restrict or pay additional fees, the applicant has:
- ☐ restricted the claims.
 - ☐ paid additional fees.
 - ☐ paid additional fees under protest.
 - ☒ neither restricted nor paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with.
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-6,8,9 .

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-6,8,9
Inventive step (IS)	Yes: Claims	
	No: Claims	1-6,8,9
Industrial applicability (IA)	Yes: Claims	1-6,8,9
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

**INTERNATIONAL PRELIMINARY REPORT
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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item IV

Lack of unity of invention

The examiner found that the application lacks unity within the meaning of Rule 13.1 PCT.

The common concept between claim 1 and the rest of the independent claims is a polymeric composition comprising a free radical polymer, free radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor.

Document D1 (DE10046024) discloses a polymeric composition comprising a free radical polymer, free radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor.

All the technical features of the common concept as indicated above are known from document D1. Therefore, the application lacks unity of invention within the meaning of Rule 13(1) PCT. The especial technical features according to rule 13 (2) PCT which provide a contribution over the prior art are not so linked to form a unitary inventive concept. Claim 1 defines a polymeric composition comprising a free-radical reactive polymer, a free-radical inducing species, a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor. The free-radical trapping species substantially suppresses degradation of the polymer in the presence of the free-radical inducing species, and can be grafted onto the polymer after the polymer forms a free-radical. Claim 7 defines a polymeric composition comprising a free-radical degradable polymer (free-radicals are formed by heat, radiation or energy), a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor. The free-radical trapping species substantially suppresses degradation of the polymer in the presence of the free-radical inducing species, and can be grafted onto the polymer after the polymer forms a free-radical.

Claim 8 defines a polymeric composition comprising a free-radical reactive polymer, a free-radical inducing species, a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor. The free-radical trapping species substantially suppresses crosslinking of the polymer in the presence of the free-radical inducing species, and can be grafted onto the polymer after the polymer forms a free-radical. Claim 10 defines a polymeric composition comprising a free-radical reactive polymer (free-radicals are formed by heat, radiation or energy), a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor. The free-radical trapping species substantially suppresses crosslinking of the polymer in the presence of the free-radical inducing species, and can be grafted onto the polymer after the polymer forms a free-radical.

Therefore the different inventions lead to different results. Consequently, the present set of claims breaks up in four inventions as follows:

Claims 1-6 : A polymeric composition comprising a free-radical reactive polymer, a free-radical inducing species, a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor. The free-radical trapping species substantially suppresses degradation of the polymer in the presence of the free-radical inducing species, and can be grafted onto the polymer after the polymer forms a free-radical.

Claim 7 : A polymeric composition comprising a free-radical degradable polymer (free-radicals are formed by heat, radiation or energy), a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor. The free-radical trapping species substantially suppresses degradation of the polymer in the presence of the free-radical inducing species, and can be grafted onto the polymer after the polymer forms a free-radical.

Claims 8,9 : A polymeric composition comprising a free-radical reactive polymer, a free-radical inducing species, a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor.

The free-radical trapping species substantially suppresses crosslinking of the polymer in the presence of the free-radical inducing species, and can be grafted onto the polymer after the polymer forms a free-radical.

Claim 10 : A polymeric composition comprising a free-radical reactive polymer (free-radicals are formed by heat, radiation or energy), a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor.

The free-radical trapping species substantially suppresses crosslinking of the polymer in the presence of the free-radical inducing species, and can be grafted onto the polymer after the polymer forms a free-radical.

There are four independent claims each one containing especial technical feature not linked by a common concept. Therefore, four different inventions can be identified. However, the examiner has grouped said four inventions in only two for the benefit of the applicant according to the following :

Claims 1-6,8,9 : A polymeric composition comprising a free-radical reactive polymer, a free-radical inducing species, a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor.

Claims 7,10 : A polymeric composition comprising a free-radical degradable polymer (free-radicals are formed by heat, radiation or energy), a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor.

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: DE10046024

D2: WO02092561

Novelty (Art. 33 (2) PCT)

1. The document D1 discloses a polymeric composition comprising a free-radical reactive polymer, free-radical inducing species, a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site and a complementary thermally-reversible bond contributor. The free-radical reactive polymer is e.g. polybutadiene or styrene-butadiene.

The subject matter of claims 1-6,8,9 over D1 is considered to be not novel (Art. 33(2) PCT).

2. The document D2 discloses a polymeric composition comprising a free-radical reactive polymer, free-radical inducing species, a free-radical trapping species having at least one trapping site and a thermally-reversible bond contribution site. The difference with the present application is the complementary thermally-reversible bond contributor.

Inventive step (Art. 33(3) PCT)

All the technical features of the present claims are described in the document D1. Therefore the claims 1-6,8,9 do not involve an inventive step (Art. 33(3) PCT).

Re Item VII

Certain defects in the international application

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents D1 and D2 is not mentioned in the description, nor are these documents identified therein.

The specification for an international application should be capable of being understood without reference to any other document (cf PCT Guidelines Ch. II 4.17).

The expression "hereby incorporated by reference" found in the description are therefore not according to the PCT requirements. The specification for an international application should be capable of being understood without reference to any other document (cf PCT Guidelines Ch. II 4.17). The expression "hereby incorporated by reference" found in the description are therefore not according to the PCT requirements.

Re Item VIII

Certain observations on the international application

Clarity (Art. 6 PCT)

1. The relative term "substantially" used in claims 1,7,8 and 10 has no well-recognised meaning and leaves the reader in doubt as to the meaning of the technical feature to which it refers, thereby rendering the definition of the subject-matter of said claim unclear (Article 6 PCT).

2. The claims of the present application are not supported by the description as required by Article 6 PCT. This inconsistency between the claims and the description leads to doubt concerning the matter for which protection is sought, thereby rendering the claims unclear.